REMARKS

Claim 1 is pending in the present application. By this Response, claim 1 is amended. Claim 1 is amended for clarification purposes to clarify that the processing entities are actual computers within a distributed architecture data processing system. Moreover, claim 1 is amended to more clearly recite that the defining of at least one role for each computer comprises defining at least one physical role and at least one logical role for each computer and both these roles being used to determine the configuration of the computer. Support for these amendments may be found at least in the originally filed claims and at least in Figures 1 and 4 of the present specification. No new matter has been added by any of the above amendments. Reconsideration of the claims is respectfully requested in view of the following remarks.

I. Telephone Interview

Applicants thank Examiner Mamo for the courtesies extended to Applicants' representative during the August 27, 2008 telephone interview. During the telephone interview, the above amendments and the distinctions of the claims over the cited art were discussed. Examiner Mamo agreed that an amendment of the type presented herein, specifically the portion of claim 1 reciting "identifying, for each computer in the plurality of computers, at least one physical role, the physical role identifying at least one function the computer plays within the distributed architecture of the data processing system, or responsibility of the computer within the distributed architecture of the data processing system," would distinguish over the Leymann reference. The substance of the telephone interview is summarized in the following remarks.

II. Rejection Under 35 U.S.C. §103(a)

The Office Action rejects claim 1 as being allegedly unpatentable over Leymann et al. (U.S. Patent No. 6,237,020). This rejection is respectfully traversed.

Claim 1 reads as follows:

1.   In a data processing system with a distributed architecture including a plurality of computers, each computer playing at least one of a plurality of predetermined roles in the data processing system, a method of configuring the computers comprising:

       defining a target configuration for each role based on a reference model for a software product, the reference model specifying for each role, components of the software product that are to be installed on a computer having the role,

       defining, in a transition table data structure, for each current state/target state pair of each component of the software product, an identifier of one or more actions required to reach the target state from the current state,

       identifying, for each computer in the plurality of computers, at least one physical role, defined by an architecture of the data processing system, and at least one logical role, defined by a software configuration of the computer, and

       configuring each computer according to a target configuration corresponding to the at least one physical role and the at least one logical role of the computer based on the current state/target state pairs in the transition table data structure, wherein:

       an indication of the physical role of each computer in a first set of computers of the plurality of computers is stored in a memory structure of the corresponding computer at an installation of the computer in the data processing system, and identifying the at least one physical role of each computer in the first set of computers includes retrieving the indication of the corresponding physical role from the memory structure,

       a software application includes a plurality of software features, each logical role being associated with a corresponding software feature, and wherein identifying the at least one logical role of each computer in the plurality of computers includes:

           detecting a software feature installed on the computer, and

           establishing the logical role of the computer according to the installed software feature, and

       wherein configuring each computer according to the target configuration includes:

           detecting a current configuration of the computer,

           identifying at least one action required to reach the target configuration from the current configuration, and

           executing the at least one action on the computer.

(emphasis added)

Applicants respectfully submit that Leymann does not teach or suggest those features of

claim 1 emphasized above. Specifically, Leymann does not teach or suggest performing

the various operations set forth above based on roles of computers, wherein these roles include a physical role and a logical role.

Leymann is directed to a mechanism for task-oriented automatic distribution of software. The mechanism of Leymann utilizes the workflow management system (WFMS) which identifies activities to be performed on a target system based on the hardware and software configuration of the target system and information about the process, and the associated programs performing the activities of the process, to be performed on the target computing device. Within the WFMS, process models are defined that identify the process to be carried out on the computing devices of a distributed network of heterogeneous computing devices. The process models are composed of defined activities that identify a program object specifying a program to implement the activity and any co-requisite or pre-requisites of software/hardware needed to execute the program on the computing devices (see column 11, line 64 to column 12, line 31).

An Asset Database is used to store hardware and software information about each computing device in the distributed network. This information includes the hardware characteristics (e.g., types of processors, size of main memory, etc.), the operating system type (e.g., version and release level) controlling the target computing device, precise information on the software environment on the target computing device (e.g., version and release level), and user identification of a user utilizing the system (see column 12, lines 47-60).

The information from the Asset Database is used along with the WFMS process models to determine which program object to assign to the particular target computing device. Thus, in Leymann, the determination of which program object to assign to a computing device is dependent only upon the hardware and software configuration of the target computing device and the particular program objects defined in the process model. This is further emphasized in the example operation outlined in Figure 4 of Leymann. The example shown in Figure 4 of Leymann illustrates that users are identified by a correlation of a task description of a current process model with an organizational database. Once these users are identified, the Asset Database is accessed to identify workstations corresponding to these users. Having identified the workstations

corresponding to the users, an appropriate program object is identified for each combination of user, activity, and operating system of each target workstation. The identified program object is then assigned to the appropriate workstation (see column 13, line 57 to column 14, line 19).

Significantly different from the presently claimed invention is the fact that Leymann does not take into consideration the physical and logical roles of the particular target computing devices. That is, Leymann only distinguishes computing devices based on their hardware/software and the users associated with these computing devices. Leymann does not recognize that the computing devices may serve different functions within an IT infrastructure and thus, have different roles within the IT infrastructure both from a physical standpoint and a logical standpoint. The presently claimed invention configures computers within a distributed system based on the roles associated with those computers. Leymann does not provide any teaching or suggestion regarding such features. Thus, the claimed invention recites a level of abstraction above that provided by Leymann and which is neither taught nor suggested by Leymann.

As an example, and for the Examiner's edification of what is meant by the physical and logical roles of computers within the present invention, the present specification states that each computer, e.g., a computer, plays a specific physical role in a network with the physical role of the computer depending on the architecture of the network. For example, in a Tivoli Management Environment, the network implements an independent region (referred to as a Tivoli Management Region, or TMR). The region has a three-tier structure with a TMR server managing the whole region from a central site, several gateways, or managed nodes, which bridge between the TMR server and corresponding clusters of endpoints (see page 4, lines 10-20 and Figure 1a of the present specification). Moreover, as described in the present specification, each computer may also play different logical roles specific for applications running in the network (see page 4, line 21 to page 5, line 4 of the present specification). Furthermore, the physical role is specifically identified within a configuration catalogue are the logical role is identified based on the software configuration of the target computer (see page 6, lines 9-16 of the present specification).

Thus, with the mechanisms of the present invention, two or more computers, e.g., computing devices, may have exactly the same hardware and software configurations, yet may have different physical roles within a distributed architecture and thus, may be configured differently due to their different physical roles. This is not possible with the Leymann reference since Leymann only determines configurations based on hardware and software configurations and does not take into account the roles that are played by the various computing devices.

Therefore, Applicants respectfully submit that Leymann does not teach or suggest defining a target configuration <u>for each role</u> based on a reference model for a software product, the reference model specifying <u>for each role</u>, components of the software product that are to be installed <u>on a computer having the role</u>. Moreover, Leymann does not teach or suggest identifying, for each computer in the plurality of processing computers, <u>at least one physical role, defined by an architecture of the data processing system, and at least one logical role, defined by a software configuration of the computer</u>. Furthermore, Leymann does not teach or suggest configuring each computer according to a target configuration <u>corresponding to the at least one physical role and the at least one logical role</u> of the computer based on the current state/target state pairs in the transition table data structure. In addition, Leymann does not teach or suggest that an indication of the physical role of each computer in a first set of computers of the plurality of processing computers is stored in a memory structure at an installation of the computer in the data processing system or that identifying the at least one physical role of each computer in the first set of computers includes retrieving the indication of the corresponding physical role from the memory structure. Also, Leymann fails to teach or suggest that identifying at least one logical role includes detecting a software feature installed on the computer, and establishing the logical role of the computer according to the installed software feature.

With regard to defining a target configuration for each role based on a reference model, the reference model specifying for each role components of a software product that are to be installed on an computer having the role, the Office Action alleges that these features are taught by Leymann in the paragraph at column 4, lines 44-67 which reads as follows:

In still another embodiment of the present invention, the activities are associated with a plurality of target computer systems. In such an embodiment, a computer-system-description of the target computer system is obtained for each of the target computer systems. The software requirements of the target computer system are also determined for each of the plurality of target computer systems based upon the process model of the WFMS and the computer-system-description of the target computer system. Finally, the determined software requirements are provided to the software distribution management system (SDMS) for each of the plurality of target computer systems. In another embodiment of the present invention each of the plurality of computer-system-descriptions includes a user identification of a user of the corresponding target computer system and the activity is associated with a user description identifying a user identification of at least one authorized user to execute the activity. In such a case, at least one target computer system is identified from the plurality of target computer systems based on the activity such that the identified target system corresponds to a user identification of a user authorized to execute the activity. The software requirements are then determined and provided to the SDMS for the identified target computer system.

This section of Leymann teaches the use of a computer system description, which may be identified based on a user, and a process model of the WFMS to determined software requirements that are then identified to a SDMS. Nothing in this section of Leymann teaches anything regarding roles of computing devices within a data processing system or defining which components of a software product are associated with which roles using a reference model. The process model in WFMS is described in Leymann at column 6, line 53 to column 11, line 6. Essentially the process model stores a sequence of activities and associated program identifiers for performing the various activities. However, nowhere in this description of a process model is there any teaching or suggestion to define roles for various computing devices within the network of Leymann and then define components of a software product that are associated with these roles.

Regarding the feature of identifying, for each computer in the plurality of computers, at least one physical role, defined by an architecture of the data processing system, and at least one logical role, defined by a software configuration of the computer, the Office Action alleges that the identification of at least one role is taught by Leymann at column 13, lines 1-8 and alleges that the SDMS of Leymann delivers and installs requested software on a target computer system based on the process model for

distributing software to a target computer system. While Leymann teaches the use of a process model and a target computing system description in the Asset Database to distribute software, again there is no teaching or suggestion in Leymann to do so based on at least one physical role and at least one logical role of a computer. Leymann only performs such distribution based on the hardware/software configuration of the computing device and is not at all concerned with the physical or logical role that the computing device is performing within the data processing system.

It is important to note that, in this feature of claim 1, the physical role is defined by the <u>architecture of the data processing system</u> while the logical role is defined by the <u>software configuration of the computer</u>. Thus, the physical role is dependent upon how the computers are laid out in the data processing system architecture and hence, the particular role that a computer plays within the architecture of the data processing system. Whereas, the logical role is defined by the software configuration of the particular computer. These are clearly two different types of roles and are defined in two different ways within the present invention. Leymann does not provide any teaching or suggestion to use these two separate and distinct types of roles to define the manner by which a computer in a data processing system is to be configured.

In a similar fashion as above, for the feature of configuring each computer according to a target configuration <u>corresponding to the at least one physical role and the at least one logical role</u> of the computer based on the current state/target state pairs in the transition table data structure, the Office Action points to the same section of Leymann, i.e. column 13, lines 1-8, discussed above. This section of Leymann teaches the use of the process model and target computing system description to distribute software. However, again, there is no teaching or suggestion to determine the configuration of a computer according to a target configuration corresponding to <u>a physical role</u> *and* <u>a logical role</u> of the computer.

With regard to physical roles and logical roles, the Office Action equates the physical roles to a processor type and the logical role to which operating system is being used (see Office Action, page 3). While the logical role may indeed include consideration of which operating system is running on a computer, the physical role of the claimed invention is not the same as simply determining what processor type is

installed in a computer. To the contrary, as specifically stated in the claim, and emphasized in the arguments above, the physical role is determined based on the architecture of the data processing system and thus, the computer's role within this architecture, not the hardware configuration of the computer (although that may influence what physical role to assign to the computer within the architecture in the data processing system). Thus, contrary to the Office Action's allegations, the physical role as it is recited in the present claims is not simply the hardware configuration of a computer.

Regarding the features of an indication of the physical role of each computer in a first set of computers of the plurality of computers being stored in a memory structure of the corresponding computer at an installation of the computer in the data processing system, and identifying the at least one physical role of each computer in the first set of computers includes retrieving the indication of the corresponding physical role from the memory structure, the Office Action points to column 11, lines 3-5; column 13, lines 17-22; and column 3, lines 2-3; and column 4, lines 65-67 of Leymann as allegedly teaching these features. Column 11, lines 3-5 states that all information about a current state of a process is stored in a database maintained by a server. Column 13, lines 17-22 states that the determination process might include obtaining the processor type and operating system type of a target computer system and using this information to select a program identification of a program executable on the processor type controlled by the operating system type. Column 3, lines 2-3 states that if a certain software package is available for different processor types, the correct software version adapted to the target computer system is selected. Column 4, lines 65-67 states that the software requirements are determined and provided to the SDMS for the identified target type.

Nothing in any of these cited sections, or any other section, of Leymann teaches or suggests the specific features of an indication of <u>a physical role</u> of each computer in a first set of computers of the plurality of computers being stored <u>in a memory structure of the corresponding computer at an installation of the computer in the data processing system</u>, or that identifying the at least one physical role of each computer in the first set of computers includes <u>retrieving the indication of the corresponding physical role from the memory structure</u>. All that the cited sections of Leymann teach is that information about the processor type and operating system type may be used to determine the correct

program to execute on the target computing system. This does not teach or even suggest the specific feature of claim 1 discussed above.

With regard to the feature of each logical role being associated with a corresponding software feature, the Office Action points to column 4, lines 65-67 which has been discussed above. As stated above, this section of Leymann states that the software requirements are determined and provided to the SDMS for the identified target type. This does not teach or even suggest that individual software features of a software product are associated with logical roles. All this teaches is that software requirements are associated with a particular target computer type and that these software requirements are provided to a SDMS.

Regarding the feature of identifying the at least one logical role of each computer in the plurality of computers including detecting a software feature installed on the computer, and establishing the logical role of the computer according to the installed software feature, the Office Action admits that these features are not taught by Leymann (see Office Action, page 3). However, the Office Action alleges that these features are "merely an alternate arrangement which falls within the level of ordinary artisan in the art" (see Office Action, page 4). Applicants respectfully disagree.

Nowhere in Leymann is there any teaching or suggestion regarding roles of computing devices. Moreover, nowhere in Leymann is there any teaching or suggestion to determine a logical role of a computer based on the particular software features of a software product that the computer implements. At most, Leymann teaches determined the software versions and releases present on a computer and then using that information to determine a program to executed to perform a software distribution process, but nowhere in Leymann is there the determination of individual software features of a software product that are implemented on a computer and then correlating those with a particular logical role that the computer has. This is not simply an "alternate arrangement" of Leymann, but a distinctly different mechanism from Leymann providing a level of abstraction and control above and beyond that described in Leymann and which is not achieved by the mechanisms of Leymann.
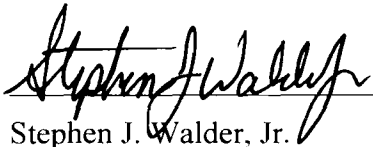
For the various reasons set forth above, Applicants respectfully submit that Leymann does not teach or suggest the features of claim 1. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 1 under 35 U.S.C. § 103(a).

III. Conclusion

It is respectfully urged that the subject application is now in condition for allowance. The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the Examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

Respectfully submitted,

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